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3 JULY 1986

USSR Report

CONSTRUCTION AND RELATED INDUSTRIES



FOREIGN BROADCAST INFORMATION SERVICE

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USSR REPORT
CONSTRUCTION AND RELATED INDUSTRIES

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CONSTRUCTION PLANNING AND ECONOMICS

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GROWTH IN INVESTMENT, NATIONAL INCOME DURING 11TH FYP

Moscow PROMYSHLENNNOYE STROITELSTVO in Russian No 11, Nov 85 pp 4-6

[Article by Doctor of Economic Sciences, Professor B. S. Bushuyev and I. A. Mekhtiyev, of the AON under the CPSU Central Committee:
"Improving the Process of Preliminary Estimation and Increasing Construction Industry Effectiveness"]

Development of preliminary estimation process and increase in effectiveness of construction industry

[Excerpt] An analysis of the USSR Central Statistical Bureau's data shows that the actual renovation level of the active part of industrial and manufacturing stock is 2.3%, and the norm is 5.6%. Established norm of 5.6% means that total replacement of the main stock must be accomplished in approximately 17 years. The industry of our country possesses considerable quantity of machinery, such as rolling mills, metal-working machines, forging and pressing and other types of equipment that have been in operation for 30-50 years. For example, the renovation level of machinery and equipment in the USSR iron and steel industry is 1.5%, although the capital costs associated with the development of this industry increased by 18% in 1983 in comparison with 1975.

The renovation and modernization process of the main production stock is taking place more intensively, as a result of reconstruction and technical reoutfitting of the existing facilities. In our country, the rate of increase of capital investments in reconstruction and technical reoutfitting of the industry is fairly high but the return from these expenditures is low. In our opinion these expenditures for reconstruction and technical reoutfitting of the industry must guarantee a substantial growth in national revenue and operating efficiency. However, in reality, this has not been accomplished yet.

From the below mentioned relationship of rates of growth of capital investments in reconstruction and technical reoutfitting of existing facilities and growth of the national revenues and operating efficiency of the national economy during 1980-1984, determined by the authors of this article on the basis of the given data, it follows that from 1981 to 1984 the growth of capital investments in reconstruction and technical reoutfitting of the existing facilities increased by 39.5%, the growth of national revenues came to 7.5% and operating efficiency ranged from 11.1% to 12.8%.

The solution to the problem of considerable increase in economic effectiveness of renovation and modernization of the main industrial and manufacturing stock, especially machinery and equipment exists, on one hand, in close inter-relationship with growing production volume of new highly productive technology in machine-building industry and on the other hand, in significant improvement in the process of preliminary estimation.

	(in percents)	
	1980	1984
Capital investments in reconstruction and technical reoutfitting of existing facilities	100	139.5
National revenue, utilized for consumption and accumulation.....	100	107.5
Operating efficiency		
in industry	100	112.8
in agriculture (public production).....	100	112
in construction.....	100	111.1

M. S. Gorbachev noted at the April 1985 meeting of the Central Committee of the USSR Communist Party that the most important thing that should be accomplished in the 12th Five Year Plan is a significant increase in the coefficient of the equipment replacement. However, due to the existing structure and divisibility of the machine-building industry, it is very hard to reach the kind of effective cooperation between facilities and unions that would create the types of the new generation machinery that would compare with the best universal examples.

In our opinion, we should more decisively follow the path of creating the production centers (complexes) that will consist of interrelated branches of machine-building industry.

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CONSTRUCTION PLANNING AND ECONOMICS

UDC 69.003.13:653.155.2

FINANCE MINISTRY, CSA IMPLEMENT NEW DECREE ON CONTRACTORS' PROFIT

Moscow EKONOMIKA STROITELSTVA in Russian No 5, May 86 pp 59-60

["Letter from USSR Ministry of Finance and USSR Central Statistics Administration (30 December 1985): "Accounting and Reporting System for Showing Profit of Contract Construction and Installation Organizations"]

[Text] USSR Gosplan Resolution 253 of 5 December 1985 has established that, starting in 1986, projected profit for construction organizations will reflect actual and expected savings on uncompleted construction projects.

To this end, the USSR Ministry of Finance and the USSR Central Statistics Administration have established the following accounting and reporting system for operations which need to be considered in calculations of profit for construction and installation organizations.

Profit in the above-mentioned organizations is determined on a monthly basis from the amount of construction and installation actually completed.

The amount of construction and installation actually completed is officially reported on Form 3 in the "Statement of Estimated Work Completed and Expenditures," which is signed by the contractor and the client.

Based on the statement noted above, the actual expenditures on completed work are removed from the credit side of account 20 (Work in Progress) and charged to the debit side of account 46 (work Completed). At the same time, the estimated cost of these projects reflects funds general contractors have paid or agreed to pay for subcontracted work and is shown on the credit side of account 46 and on the debit side of account 62 (Subaccount 5 of Accounts Settled with Buyers and Clients).

The calculated amount clients which owe for work completed (account 62-5) is shown in the contract construction-installation organization's balance in the variable working capital section, on line 260 (Work Completed on Uncompleted Construction Projects).

The amount clients owe for construction of completely finished and functioning enterprises and others facilities, whose documents are transferred to the bank, is removed from the credit side of account 62-5 and charged to the debit side of account 62-1; the estimate of this amount is shown in section III of the balance of the appropriate lines (371, 372, and 410).

When clients remit funds for completed construction projects, the amount they owe for completed work on the given project is removed from the credit side of account 62 and charged to the debit side of account 51 (Clearing Account).

Every month, account 46 is credited and account 61 (Payments on Advances) debited in the amount of the remittals for expenses (general contracting organizations including expenditures made by subcontractors).

The amount (the balance of account 61) of accounts which are not submitted to the bank in time for payment by the client is shown in section III of the balance on the "other Debtors" line.

Remittals for accounts which have been paid or accepted for payment by the bank are recorded on the credit side of account 61 and on the debit side of account 62, and are reflected in section III of the balance on the lines corresponding to those for the amount owed by the client (the balance of account 62).

In cases where the client does not remit on a monthly basis and is, instead, covered by bank credit until the object under construction is operational, expenses incurred are recorded in account 62 (from the credit side of account 46), and are reflected together with the estimated cost of completed construction-installation work in the balance for line 260.

Beginning with January 1986, accounting procedures for the cost of completed work on and ancillary expenses for uncompleted projects that contract construction organizations are working on as of 1 January 1986 will be those established for work completed in January.

The difference between estimated and actual cost of work completed appearing in account 46 is entered on a monthly basis in account 80 (Profits and Losses).

When performing accounting operations to determine profit (or loss), the amount of such profit (or loss) for work completed before 1986 is placed after the appropriate reporting lines.

The accountant maintains his records of construction-installation work completed in accounting ledgers (log order No 10-s and others) in accordance with the system established in Basic Principles of Projecting and Maintaining Accounts of Construction-Installation Project Costs. Once the constructed object has begun being used, however, data emanating from the above accounting procedure are not coordinated with parallel data from other accounting sources.

In this connection, data on profits and losses, which are reflected in the balance on lines 120 and 770, are determined from data in section 2 of the Report on Construction-Installation Project Costs (form No 2-s) as the difference between the sum of lines 101 and 106 in column 1 and the sum of lines 101 and 106 in column 3 (which is reduced by the amount of the total of the remitted expenditures (column 4)).

The sum for column 1 added to that for line 107 of section 2 of the cost report should equal line 260 ("Work Completed on Uncompleted Construction-Installation Projects") of the balance.

The expenses section of the ministry- and department-level financial plans should contain a mechanism to permit profit obtained from work completed before 1 January 1986 to compensate funds spent during the pre-report period on measures prescribed in the plan. Other funds which should be compensated are those which have been spent to pay the costs of obtaining savings from reduced production costs and from plan-specified savings for uncompleted projects. The above-mentioned profit is subject to treatment as a statutory fund if the 1986 balance is changed.

The system that has been adopted for projecting the profit of construction-installation organizations does not change the system for projecting commercial construction output or the current system of crediting uncompleted construction projects and payments for completed construction projects.

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CONSTRUCTION PLANNING AND ECONOMICS

OFFICIALS DEFINE 1986 GOALS ON STANDARD, EXPERIMENTAL DESIGN

Moscow STROITELNAYA GAZETA in Russian 8 Dec 85 p 1

[Unsigned article: "In the USSR State Construction Committee"]

In the USSR State Construction Office.

[Text] At its routine meeting, the board of the USSR State Construction Office examined the national plans for standard and experimental design, the study and the correlation of the national and foreign experience in design and construction for the year 1986. These plans reflected the requirements of the resolution made by the USSR Soviet Ministry "For further development of preliminary estimation process and the rising importance of the expert's opinion and the author's supervision in the construction industry", regarding the increase in quality of standard design for mass construction of production buildings and structures, the review of the standard design stock and the exclusion of the documentation from stock that does not correspond to the modern achievements of science and technology.

As a result of this year's review, the standard design stock was reduced to more than half its size. Beginning with 1986, the standard design development is planned to be done, as a rule, on competitive basis and to be confirmed after examination and inspection by the scientific and technical counsel and the members of the ministries and departments. The development of the economical, regional and standard design for housing and agricultural construction projects, where local conditions are considered, will be carried out.

The project thematics of the standard design plan are directed towards further increase in industrialization of construction industry, reduction in design and production time, reduction in construction costs, economy of labor, materials, fuel and energy resources, and also increase in architectural, aesthetic quality and performance of the projects.

Much attention is given to the design of the block units, and the development of the design documentation for the block coverings construction of the production buildings, which will allow further development of the conveyor method of assembly and assembly of the buildings in large blocks. Altogether, the completion of 85 subjects is foreseen in this direction.

The work in developing and expanding the usage of the buildings made from light, metallic structures and delivered in units will be continued. The nomenclature for the block sections of the one-story production buildings is worked out for the regions of Siberia and Far East. The significant increase in the volume of standard design development for the reconstruction and technical retrofitting of the facilities for the elements of buildings, structures and engineering systems is foreseen. A series of new standard designs will be created for the branches of the USSR GAP. A significant volume of work is planned to be completed in the development of the automotive design projects in the construction industry, and creation of programmed resources.

At the same time, at the board meetings, individual unfinished parts of the specified design projects were made apparent. It was noted that not all thematics of work respond to the modern demands of the acceleration of scientific and technical progress.

Many research and design organizations of various ministries and departments of the USSR and the Union Republics will take part in the realization of these plans.

The board of the USSR State Construction Office considered and approved the design plans for seismic microregionalization of the territories. In accordance with proposals of state construction offices of the Union Republics in 1986, this work will be completed for 32 cities and regional centers of the country, located in the zones of seismic activity of 7 or more points on Richter's scale.

12247

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URBAN PLANNING FOR NEW CITIES OF FAR NORTH

Moscow SOVETSKAYA KULTURA in Russian 20 Feb 86 p 1

[Article by M. Kushnir of Leningrad, under the heading: "Concerns and Attention to the Oil-Gas Complex": "Yamburg: the Start of a Biography"]

[Text] Can one see the city of the future today? One can, if one visits the Leningrad Scientific-Research and Planning Institute for City Building [NIIPG], where they are creating general plans for populated areas, some of which are not yet on the map.

The institute was standing at the cradle of cities which are legends today, such as Komsomolsk-na-Amure and Magnitogorsk; here is where the projects were born for Angarsk, Ust-Ilimsk, and Sayangorsk. And in recent years-- years of explosive development of the oil and gas extraction industries; years of the development of the natural deposits of the Far North, the "center" of interest of the planners is moving ever closer to the Arctic Circle: beyond Surgut--Nadym; beyond Nadym--Yamburg...

"If one speaks of the North," relates Candidate of Architecture V. Smirnov, director of the institute, "one must always remember that this region covers a vast area, and is therefore extremely varied in terms of the natural and climatic conditions."

This approach, taken by the specialists of the institute, is of cardinal importance, primarily to the continuing discussion on the topic: Should we build temporary worker settlements in the Far North, or should we build cities? At the Leningrad NIIPG they are convinced that for the workers of the oil and gas industry and their families it would be better if they were to live in a base city, and at the site of the mineral deposits itself, situated in a zone with extreme natural and climatic conditions, a temporary settlement should be built for the shift workers. Only in this manner can one find comfort in the polar regions.

"Comfort, yes, and economy too," affirms V. Smirnov. "I can envisage a construction project in the higher latitudes. All the materials must be brought here, right down to the nails. And this is extremely expensive. But if, let's say, we are faced with providing housing--in addition to housing for the workers and their families, a highly-developed infrastructure must be developed. That is, apart from the housing, we must also have schools, kindergartens, polyclinics, additional domestic services, and so

on. And this means new expenditures, and quite a lot at that. But that's not all. After all, the infrastructure will require new workers, and consequently new housing construction, which entails additional expenditures.

In a word, for the successful social and economic development of the northern regions, the ideas put forth by the institute must be implemented: simultaneous and balanced construction of both base cities, and settlements for the shift workers. And the first valuable experience already exists. The ideas of the planners at the Leningrad NIIPG were embodied in the plan which they worked out for housing the populace of the West Siberian Oil and Gas Complex.

To a great extent the principle of "base city--shift worker settlement" defines the current form of the Siberian settlements. Let's say that Novyy Urengoy or Nadym are the base cities. Here they are planning and are building more establishments for children than in the central zone--schools, preschool institutions and sports facilities. And this is understandable--the cities are young not only in terms of their date of birth, but also in terms of their demographic makeup--and that means they have a lot of children there.

Apartments in these cities have a greater overall area in comparison with the average norms.

But the shift workers' settlement, where people stay during their duty shift, is another matter altogether. Yamburg can serve as an example of such a settlement.

In the 12th Five Year Plan new houses of the hotel type, with a complete set of cultural and domestic accommodations providing autonomous services, will appear here.

It is important to note that the construction of modern Yamburg will commence this year already.

According to the general plan, by the end of the five-year plan about 9,000 people will be living in the shift-worker settlement.

"The times demand developing a modern type of city-building concept, especially for those places where matters concern pioneer settlements," said V. Smirnov at the end of our conversation. "Presently, flexible production has become the main element of industrial development in the economy. I think that in a certain sense the principle of flexibility must prevail in questions of city-building tasks as well. All projects, from individual apartments to the general plan, should be worked out on the basis of standard economical modules, which envisage the use of prefabricated materials, but which are directly connected with the specific factors inherent only in this or that locality: economic, demographic, and natural-climatic factors. In other words, taking into consideration the interests of the people who will be living and working in that locality."

CONSTRUCTION PLANNING AND ECONOMICS

USSR ANNUAL CONSTRUCTION PLAN SCHEDULE UNBALANCED

Moscow STROITELNAYA GAZETA in Russian 12 Mar 86 p 2

[Article by freelance correspondent Yu. Utkin under the heading: "1986 Startup Projects": "Important Amendments to the Plan: Ukrainian Installation Workers Nearing Periods for Project Startups"]

[Text] In the first quarter of the present year the organizations of USSR Minmontazhspestroy [Ministry of Installation and Special Construction] have planned to put into operation 0.7 percent of the total number of projects and capacities--and in the last quarter, 92 percent!

Moreover, quite a few of them concern the so-called "insignificant" capacities, where the volume of work does not as a rule exceed one million rubles. These, unfortunately, they also intend to hand over at the end of the year. They include, for example, purification plants, hothouses, mechanized warehouses, and certain projects in the industrial infrastructure.

Would it be possible to bring up the periods for their introduction and shift them from the fourth quarter to, shall we say, the third or the second?

After all this would permit reducing the peak workload of the construction-installation organizations, and reduce the number of projects to be started up at the end of the year. In the labor collectives of Minmontazhspestroy of the Ukrainian SSR--such as those of Dneprometallurgmontazh [Dnepr Installation Association for the Metallurgical Industry], Podolskprommontazh [Podolsk Industrial Installation Association], Koksokhimteplomontazh [Coking, Chemical, and Heating Plant Installation Association], and Zaporozhmetallurgmontazh [Zaporozhye Installation Association for the Metallurgical Industry], together with the general contractor construction organizations, have carefully analyzed this question and came to the conclusion that solving this problem is realistic. Nine projects with annual volumes of construction and installation work of up to one-half million rubles can be put into operation in the second quarter; and they have decided to finish in the third quarter 12 construction projects which are "a bit more expensive." Thus, by the end of the year there will remain only 26 not especially large capacities to be turned over for operation.

It is planned to speed up the erection of the Berdyansk Fibreglass Plant, of a subsidiary of the Zaporozhye Abrasives Combine, and the industrial base of the Krivoy Rog Housing Construction Combine; also, construction of purification plants in Kommunarisk; hothouses at the Donets Vegetable Works Sovkhoz; a mineral fertilizer warehouse in Svetovo, Voroshilovgrad Oblast; vegetable storage facilities in Zaporozhye Oblast, and many others. To do this, in a number of cases, it is only necessary to increase the rate of general construction operations--to turn over the front to the installation workers earlier than planned. The construction organizations of the Ukrainian SSR Heavy Construction Ministry have given their "OK" to the accelerated tempo. At other projects it is necessary to speed up deliveries of technological equipment and materials; moreover, the amounts to be delivered are not large.

The Ukrainians' initiative has found support. At the Ministry of the Machine Tool and Tool Building Industry, for example, a special meeting was held at which it was decided to ensure delivery of equipment ahead of time for the purification plants of a subsidiary of the Zaporozhye Abrasives Combine, and also for the engineering and laboratory building at the Dnepropetrovsk Machine Tool Building Plant. It is planned to put these projects into operation one quarter ahead of schedule. The USSR Ministry of Ferrous Metallurgy has also taken measures to provide ahead of time the material resources for certain construction projects in Kommunarisk and in Krivoy Rog. And the Ministry of the Electrical Equipment Industry has promised to assist the construction workers at the Kamenets-Podolskiy Electromechanical Plant.

Unfortunately, not all ministries and departments were as forthcoming. Those taking part in putting up the new capacities at the Stirol Production Association in Gorlovka, at the Azot Production Association in Severodonetsk and Dneprodzerzhinsk, at the Steklo-Volokno [Fibreglass] Plant in Berdyansk, and at other enterprises, are waiting for support. Here the periods for delivering technological equipment, cable products, metal, and other strictly-funded materials, must also be reexamined. But without the support of the client ministries, as for example the Ministry of Mineral Fertilizer and the Ministry of the Chemical Industry, these problems cannot be solved.

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CONSTRUCTION PLANNING AND ECONOMICS

PROBLEMS AT MOSCOW OBLAST CONSTRUCTION PROJECTS

Moscow LENINSKOYE ZNAMYA in Russian 19 Mar 86 p 1

[Article by V. Peshkov, chief, Construction and Construction Materials Department, Moscow Oblast CPSU Committee, under the heading: "Economic Commentary": "A Regular Production Flow for Construction Projects"]

[Excerpts] For the oblast as a whole, the volume of completed construction-installation work has increased by 19 percent, and capital investments by 21 percent, in comparison with the corresponding period last year. Housing totalling 169,000 square meters overall has been put into operation, which is 80,000 square meters more than was introduced in January to February last year; in addition, a number of industrial, agricultural, cultural-domestic and municipal projects have been completed.

The leading construction organization of the oblast--Glavmosoblstroy [Moscow Oblast Main Construction Administration]--has fulfilled its plan for contract work in the amount of 117,000,000 rubles, which exceeds last year's level by 3.5 percent; and there was a 6.8 percent increase in work carried out by the administration itself.

However, on the whole the state of affairs in capital construction is not yet satisfactory. There was sharp commentary on this at the oblast report and election conference. Today we cannot put up with low building rates, with nonfulfillment of state plans, with poor-quality work, and with large amounts of frozen assets in incomplete construction projects--which add up to more than 2.8 billion rubles in the oblast as a whole. In the years of the 11th Five Year Plan alone, capital investments amounting to over one billion rubles were not assimilated; 900 million rubles worth of construction and installation work was not completed; more than 1.2 million square meters of housing was not put into operation, nor were a number of preschool and health care establishments and municipal facilities.

As before, labor and material-technical resources continue to be frittered away on a large number of construction projects in the oblast and on projects where work was begun anew--the number of which is not declining. And this gives birth to a great deal of "unfinished business"--more than 700 million rubles worth of which is credited to the account of Glavmosoblstroy. A number of projects, and not especially complicated ones at that, have "grown long beards," if one can put it that way; work on them was begun back

in the 10th Five Year plan. In critically analyzing the work of the last two months, one must frankly declare that a great deal has not yet been done. The plan for capital construction, and construction-installation work as a whole, remains unfulfilled despite the rates achieved.

The construction industry has its own debtors as well. The Domodedovo, Pushkino, Stupino, Podolsk, and Shchelkovo party gorkoms are not devoting the required attention to lagging enterprises. For the second month certain construction industry enterprises in the Kolomenskiy, Volokolamskiy, and a number of other rayons, have failed to complete their assignments for commodity production output. Among the lagging enterprises is the prefabricated ferro-concrete structural member [ZhBK] plant in the Shchelkovskiy Rayon. Its debts from last year continue to grow.

The Serpukhov ZhBK plant, the Ramenskoye ore-dressing combine, and the Korenyevskiy construction materials plant are not fulfilling their contracted obligations for deliveries.

The basic reasons for the lags in a number of collectives are explained to a large extent by the fact that the transfer of the economic mechanism to the intensification track is still going slowly, effective organizational measures are being introduced poorly, and the level of executive discipline is rather low.

Oblast construction workers are faced with serious tasks in the 12th Five Year Plan. In the current year alone, it is necessary to put on-line more than 3 billion rubles in capital investments, and to carry out construction and installation work worth more than 1.5 billion rubles. An extensive program for housing and civil construction remains to be implemented, and many very important industrial projects must be put into operation--to include the third line at the unique "350/250" mill at the Elektrostal plant; industrial capacities at the plants of the Kolomenskiy Diesel Locomotive Plant imeni V.V. Kuybyshev; and at the Khrapunovskiy Instrument Plant, the Davydково Agricultural Machinery Plant, the Podolsk Machinery Plant imeni M.I. Kalinin, the Kurovskoye Industrial Melange Yarn Association, the Zagorskaya Hydro-Electric Power Station, and at the Istrinskiy Baked Goods Combine.

Construction workers must still resolve large problems in strengthening the base of the agroindustrial complex in order to support an increase in products from animal husbandry and field cultivation. For these purposes the state has allocated over 4 billion rubles in capital investments. For the years 1986-1987 alone, facilities are to be built on Moscow Oblast farms to accommodate 61,400 animals; also to be built are 300 dutch barns and sheds, root vegetable storehouses with a capacity of 178,000 tons, mineral fertilizer storage facilities, and a number of projects for the processing industry.

Construction of housing and socio-cultural-domestic facilities will be on an even greater scale in the rural areas. Over a two-year period it is planned to put into operation more than one million square meters of housing, to include 221,000 of the farmstead type. And it is planned to carry out construction of 250 production centers, along with facilities for socio-cultural and domestic purposes.

The collective contract must become one of the main levers for accelerating the rate of construction. This was convincingly shown by the results of the work of Mosobltselstroy [Moscow Oblast Rural Construction] Trust No. 18, headed by Nikolay Ilich Travkin, a delegate to the 26th and 27th CPSU Congresses. After working under the new conditions for only a year, the trust provided 20 percent growth in production, eliminated losses, and accrued profits of 1,300,000 rubles.

Such results sow confidence in the fact that this is the proper path, and that in the future all collectives must firmly and undeviatingly adhere to it. This was once again confirmed at the recently-held oblast zonal conference of construction workers, at which the task was set for the majority of construction-installation administrations [SMU] and mobile mechanized columns [PMK] to switch to this progressive method in the current year, and for all trusts as a whole to do so when they are ready.

In the oblast at the present time, three SMU trusts and 75 PMK collectives are operating under the new organization. Unfortunately, however, this amounts to only one-fourth of the total number of the construction administrations of Glavmosoblstroy. There are no collectives operating under collective contracts in the Leninskiy, Lyuberetskiy, Mytishchinskiy, Pavlovo-Posadskiy, and other rayons.

In accordance with a decision of USSR Goskomtrud [State Committee for Labor and Social Problems] and the AUCCTU, in 1986 and 1987 an experiment will be conducted in introducing the collective contract at ten enterprises of Glavmosoblstroy materialov [Moscow Oblast Main Administration for Construction Materials]. This is a very responsible and serious task, and the further spread of this progressive method will depend on its successful fulfillment.

Nearly 400 million rubles in capital investments have been allocated for the development and technical retooling of the existing production base of construction and construction industry enterprises; these investments will undoubtedly provide tangible results, but it is now a matter of assimilating them to the fullest.

9006

CSO: 1821/147

CONSTRUCTION PLANNING AND ECONOMICS

USSR CONSTRUCTION MINISTER REPLIES TO IZVESTIYA ARTICLE

Moscow IZVESTIYA in Russian 22 Mar 86 p 3

[Article by V. Reshetilov, USSR minister of construction: "To Quicken the Tempo of Construction: The Paradoxes of Lengthy Construction of No 18, No 40" under the rubric "After Having Appeared in IZVESTIYA". For the translation of the original article see JPRS-UCR-86-010 of 4 June 1986]

[Text] Regarding the article by V. Romanyuk published under the heading "The Paradoxes of Lengthy Construction" relating to the activity of the Kalinin Territorial Construction Administration, I would report the following:

The reasons for the setback in the scheduled completion date of the Khimvolokno" ["Chemical Fiber"] Production Association's production building are lack of workers for the construction site and untimely deliveries by the client of approximately 300 pieces of equipment, including handling equipment as well as stainless steel and other materials. The client has stated that all of the equipment will be delivered in the next few days, and the facility should be in operation in the third quarter.

The USSR Ministry of Construction Collegium has reviewed the question of easing plan commitments and rendering assistance to the Kalinin Territorial Construction Administration. It has been decided to transfer part of the planned work to the VSMO Soyuzspetsstroy [All-Union Special Construction Trust]. The Kalinin Territorial Administration has been instructed to obtain the means from the client for advanced development of production capacities. Construction of a maternity home and a medical school has been planned for 1986 at a cost of R1.3 million.

The CPSU Kalinin Obkom and Oblispolkom have not introduced proposals for a territorial organizational structure and creation of a single construction organization in Kalinin Oblast. The USSR Ministry of Construction proposed to Gosplan in August 1985 a reduction in the number of simultaneous construction projects in Kalinin Oblast and a temporary shut-down of a number of sites on which work had begun. However, these proposals for the temporary shut-down of projects were not accepted.

[Signed] V. Reshetilov, USSR minister of construction

CSO: 1821/165

CONSTRUCTION PLANNING AND ECONOMICS

UDC 69.05:658.562

GOSSTROY STUDY ON LOW QUALITY WORK BY CONSTRUCTION TRUSTS

Moscow PROMYSLENNOYE STROITELSTVO in Russian No 4, Apr 86 pp 16-18

Article by I.A. Akimova, Candidate of Economic Sciences and A.P. Ananova, economist at the Scientific Research Institute of Agricultural Economics: "Why Is the Quality of Construction Declining?"

Text The task of ensuring the normative quality of projects placed in operation, from one five-year plan to another, appears as one of the most important national economic tasks. The need for raising the quality of construction substantially is pointed out in the Basic Directions for the Economic and Social Development of the USSR for the 1986-1990 Period and for the Period Up To the Year 2000.

Studies carried out at NIIES Scientific Research Institute of Construction Economics of USSR Gosstroy on newly activated enterprises of 17 union ministries revealed that low quality in the erection of installations results in losses to the national economy on the order of many millions of rubles. A slowdown takes place in the schedules for mastering production capabilities, as a result of which the production of industrial goods declines, production costs increase and the return from invested capital expenditures is delayed. The mentioned negative factors underscore the fact that low quality construction is one of the causes of a slowdown in the rates of development for industrial production. The words uttered by M.S. Gorbachev during a conference in the CPSU Central Committee on 11-12 June 1985 apply fully to construction. He stated: "An increase in the quality of output is a very accurate and summary indicator for scientific-technical progress, culture and labor discipline."

Stable (normative) quality can be achieved in installations placed in operation only upon the condition that KS UK SMR kompleksnaya sistema upravleniya kachestvom stroitelno-montaznykh rabot; all-round system for controlling the quality of construction-installation work/ is introduced into operations in construction organizations. Here we have in mind not the formal introduction of a system (preparation of standards for an enterprise, existence of a document on introduction into operations, the carrying out of similar quality days twice annually and so forth) but ensuring constant action (reproduction) of all of the principal functions of control and particularly quality control and evaluating and stimulating quality.

At the beginning of 1985, the document for the introduction of KS UK SMR included one third of the country's construction organizations. Roughly the

same number of organizations are engaged in developing and introducing individual elements of the system. However, a noticeable improvement in the quality of the SMR /construction installation work/ is not being observed. Thus a random study of the quality of SMR, conducted in 1983 and 1985 at five construction organizations of Glavsochispetsstroy and Glavsrednevolzhskstroy of USSR Minpromstroy /Ministry of Industrial Construction/ revealed that quality in SMR had deteriorated in 1985 compared to 1983 (the selection of main administrations and construction organizations was random in nature and did not indicate that the situation was better in other departments).

Selective control over the quality of individual types of work, with simultaneous uncovering of the causes of deviations from the normative requirements, was carried out by the quality services of orgtekhtstroys using the NIIES method. It was conducted based upon control reports (charts) developed by NIIRS jointly with KTI /control technological tests/ of the USSR Minpromstroy. Those indicators and requirements of the SNiP /construction norms and regulations/, the non-fulfillment of which leads to the appearance of critical and considerable defects, were introduced into the control reports. Since a selection of the indicators is a very important aspect with regard to achieving an objective evaluation of the actual level of quality, the direct executive agents for carrying out the work -- chiefs of the TsSL's /central construction laboratories/ of the mentioned main administrations -- participated in a discussion of the control reports. Control was exercised over the following types of work and structural elements: installation of foundations, laying of brick walls, installation of columns, external wall panels and floor slabs, installation of collar beams and girders, welding, hermetic sealing of joints and installation of rolled carpeting. Thus, for selective control and for uncovering the causes of violations of the normative requirements, operations were selected which affect to a greater degree the indicators for reliability and durability in a building or its structural elements.

In all, 7,900 observations were carried out in 1985 at the mentioned five trusts during the process of selective control and roughly the same number during 1983. The actual level of quality for the carrying out of individual normative requirements and types of work is described by the coefficient for defects K_d , which is considered to be the ratio of requirements carried out with violations to all of the requirements (indicators) studied. The level of defects on the average for the trusts and main administrations studied, with regard to selective control of SMR, is furnished in Table 1.

The greatest increase in the level of defects in SMR (reduction in quality) is observed at Trust No. 11 of Glavsrednevolzhskstroy -- more than twofold. On the whole, the level of defects for three construction organizations increased by 48 percent compared to 1983.

Such a sharp deterioration in quality did not take place (K_d increased by 18 percent) for Glavsochispetsstroy on the whole. However, at Trust No. 1 the coefficient of defects increased by 64 percent. And the level of quality increased by 8 percent at only one organization of the five trusts studied.

Although the data describes the work of only five trusts and thus the conclusions cannot pretend to be all-encompassing, it appears that they require

fixed attention. Indeed, systematic reports in the periodic press (the newspapers IZVESTIYA, PRAVDA, SOTSIALISTICHESKAYA INDUSTRIYA and others) serve to underscore the fact that the number of complaints regarding the quality of construction is not declining.

Table 1

Организация (1)	Уровень де- фектности K_d (2)		Динамика уровня дефектности, % улучшение (+), ухудшение (-) (3)
	1983 г.	1985 г.	
Главсохиспецстрой (4)	0.17	0.21	+24
в том числе:			
трест № 1 (5)	0.14	0.23	+64
трест № 3 (7)	0.2	0.2	0
Главредневозжск- строй (8)	0.21	0.31	+48
в том числе:			
трест Промстрой (9)	0.25	0.25	-8
трест № 11 (10)	0.2	0.44	+120
ДСК (11)	0.19	0.37	+92

Key:

- | | |
|---|------------------------------------|
| 1. Organization | 6. Trust No. 1 |
| 2. Level of defects, K_d | 7. Trust No. 3 |
| 3. Dynamics of level of defects.
% of deterioration (-), or
improvement (+) | 8. Glavsrednevolzhskstroy |
| 4. Glavsochispetsstroy | 9. Promstroy Trust |
| 5. Including: | 10. Trust No. 11 |
| | 11. DSK /house building combining/ |

The most defect-ridden type of work in 1985, for both main administrations, was the laying of brick walls. Here the K_d for Glavsrednevolzhskstroy increased by 21 percent compared to 1983 and for Glavsrednevolzhskstroy -- by 35 percent. Compared to 1983, the K_d increased for a number of operations: for the installation of columns in Glavsochispetsstroy -- by 38 percent; for the installation of floor slabs in Glavsrednevolzhskstroy -- by a factor of 2.8, for the installation of external wall panels -- by 48 percent and for the hermetic sealing of joints -- by 38 percent. Special emphasis should be placed upon the fact that the K_d decreased (that is, the quality improved) for a number of operations as a result of the introduction of appropriate measures within the framework of the KS UK SMR. Thus, within Glavsochispetsstroy the K_d for the installation of collar beams decreased by 14 percent and for the hermetic sealing of joints -- by 17 percent. Within Glavsrednevolzhskstroy -- for welding work by 32 percent and for the installation of columns by 20 percent.

Substantial differences in the coefficients for defects by types of work in both main administrations underscore the fact that measures aimed at raising the quality of SMR cannot be introduced in an unimaginative manner in all organizations. Thus the quality of work within Glavsrednevolzhskstroy when welding connecting elements occupies fifth place and hence at the present time there is no requirement for large-scale activity aimed at lowering the coefficient of defects. Such organizational-technological work was carried out

earlier and thus the ranking of work in terms of the importance of the K_d changed from two to five. In Glavsochispetsstroy, conversely, the quality of welding work rose to second from fifth place in terms of the value for the K_d . Hence, fixed attention must be given at the present time to this type of work in a given main administration.

Within Glavsrednevolzhskstroy, the installation of monolithic reinforced concrete foundations and reinforced concrete foundations under columns is being carried out with a coefficient of defects that is higher than average for all types of work: 0.36 and 0.35 respectively compared to 0.31. In 1983, these types of work were not controlled and thus it was impossible to compare the dynamics for the level of quality. However, a comparison of the quality of fulfillment of these types of work within Glavsochispetsstroy reveals that Glavsrednevolzhskstroy is suffering from a bottleneck in this regard.

Inspections carried out on the quality of erection of installations of Gosstroyinspektsiya have shown that Gosstroy USSR devotes a great amount of attention to the quality involved in the building of foundations. To a large degree, such work determines the reliability of an installation on the whole. In this regard, mention should be made of the relative favorable status of the quality of foundations within Glavsochispetsstroy.

The causes of the appearance of SMR defects and also a quantitative evaluation of them in construction practice have been studied to a lesser degree than the level of their quality. Meanwhile, an efficient classification of the causes is the basis for reliable information on the importance of individual conditions and factors affecting the quality of SMR. The method of investigation called for the singling out of five principal groups of causes which reflect all of the production elements:

1. Unsatisfactory status of technical documentation

1.1 Incompleteness of planning and estimates documentation, including the absence of a PPR /work plan/

1.2 Imperfections in the technology included in the PPR.

2. Unsatisfactory status of machines, mechanisms, technological equipment and instruments

2.1 Absence of the machines and mechanisms required

2.2 Absence of technological equipment and instruments.

2.3 Machines and mechanisms in use become obsolete.

2.4 Equipment and instruments in use become obsolete.

3. Unsatisfactory status of measuring equipment

3.1 Lack of control-measurement instruments and laboratory equipment.

4. Low quality of raw materials, other materials, parts and structures.

4.1 Use of materials, parts and structures not called for in the plan.

4.2 Low quality of materials, parts and structures delivered for use.

4.3 Absence of input control

4.4 Violations of rules for transport and storage.

5. Low quality of labor

5.1 Inadequate skills of workers

5.2 Absence of operational control

5.3 Violations of technological sequence for carrying out work in accordance with management instructions.

The following causes are the most important from the standpoint of Glavsochispetstroy and Glavrednevolzhskstroy: 4.2 -- low quality of raw materials, other materials, parts and structures and 5.2 -- absence of operational control by masters and work superintendents, with one of these causes occupying 1st place in one main administration and the second -- in the other main administration.

The investigation confirms the opinion expressed by builders in all areas that low quality SMR is caused mainly by the suppliers of materials, parts and structures. Truly, compared to investigations carried out by NIIES among a large number of construction organizations in 1980 and 1983, the proportion for this cause has increased. During former investigations, the 4.2 cause accounted for an average of 25 percent of all defects uncovered. However, the growth in the proportion of this cause underscores not only a deterioration in the quality of output by enterprises of the construction industry. The overall status of quality control has also deteriorated. Neither operational control over the quality of work nor input control over the quality of products being received are being carried out at construction projects. Everything being delivered by plants is being accepted at the construction sites. Only a minimal amount of advertising work is being carried out.

Inadequate worker skills occupies third place among the causes of low quality SMR. The causes of low quality SMR are cited in Table 2.

Thus the causes ranked 1, 2 and 3 are the principal ones and measures aimed at raising the quality of SMR should be developed for the purpose of eliminating these causes first of all. It should be emphasized that the elimination of the mentioned causes will depend to a large degree upon the work of the main administration, trusts and SMU [construction and installation administration]. In this regard, it would be proper for the ministry to obligate subordinate organizations, in a planned manner, to introduce measures aimed at lowering the proportion of the mentioned causes in the interest of maintaining the quality of the SMR. The desired results can be achieved by composing sound plans and

measures, with instructions as to the specific volume for their introduction and strict control over their implementation and regarding the inevitability of punitive measures against leaders in the event of non-fulfillment of these plans.

The low quality of parts and structures is not directly dependent upon a construction organization. But improvements in the level of their quality are dependent upon the technical policy carried out by the ministry at plants of the construction industry, which are subordinate to the ministry. Logic suggests that one should be familiar with not only the predominant causes of low quality carrying out of SMR on the whole, but also with the manner in which they are differentiated among individual types of work and the normative requirements. Such an analysis can be conducted using the data of control reports. Here the controllers must indicate the specific causes for the appearance of defects for each normative requirement. Thus, in Glavsochispetsstroy operational control must be intensified mainly in connection with the welding of connecting elements and the hermetic sealing of joints by means of seals. Operational control should be introduced into Glavrednevolzhskstroy mainly in connection with the laying of brick walls, the installation of external wall panels and the installation of floor slabs.

Table 2

Инцидент № (1)	Причина (2)	Удельный вес причин в об- щем количест- ве указанных (3) случаев	
		Главсох- испестрой	Главред- неволжск- строй
		(4)	(5)
4.2.	Низкое качество поставленных материалов, деталей, конструкций (6)	55,5	27,5
5.2.	Отсутствие операционного контроля мастера (прирабаки) (7)	24	36,8
8.1.	Недостаточная квалификация рабочих (8)	5,1	15,6
	Остальные причины (9)	15,4	20,1

Key:

- | | |
|---|---|
| 1. Cause number | 6. Low quality of materials, parts and structures delivered |
| 2. Cause | 7. Absence of operational control by masters (work superintendents) |
| 3. Proportion of causes for overall number of incidents pointed out | 8. Inadequate worker skills |
| 4. Glavsochispetsstroy | 9. Other causes |
| 5. Glavrednevolzhskstroy | |

Labor skills in Kuybyshev should be raised primarily through the installation of pile-supported foundations under a monolithic collar beam and through the installation of monolithic reinforced concrete foundations and the installation of floor slabs, collar beams and building girders. The problem of improving labor skills in Sochi organizations is not as acute.

Causes 2.4 and 3.1, which describe a lag in the technical level for construction production, are mentioned only rarely in the reports. Thus, obsolete equipment

and instruments (cause 2.4) are employed for only two types of work within Glavsochispetstroy: for the installation of monolithic reinforced concrete foundation and paper roofing. A lack of control-measuring instruments and laboratory equipment was noted in connection with three types of work: the installation of monolithic and pile-supported foundations the laying of brick walls. The proportion of incidences of these causes compared to the overall number is only 2 percent.

A similar picture has been observed within Glavrednevolzhskstroy, although here the number of incidents involving these causes is somewhat higher than at Glavsochispetstroy. The proportion of defects arising in connection with the use of obsolete equipment and instruments is 4 percent and this is also encountered during the installation of monolithic reinforced concrete foundations and the installation of reinforced concrete foundations under columns. Defects arising as a result of a lack of control-measurement instruments and laboratory equipment appear in connection with two types of work: laying of brick (walls and reinforced brick partitions -- just as at Sochi) and the installation of external wall panels. Their proportion is 3 percent.

As is apparent, the modern technical level of construction production in both main administrations does not hinder the maintenance of a normative level of quality in the predominant number of types of work studied. During a given stage, an increase in the technical level of construction production is of very great importance with regard to raising labor productivity and, as a result, improving the economic results of the construction organizations. It is possible today to raise sharply the quality of SMR and to achieve stability in its normative level based upon the existing technical level for SMR production.

NIIES included in its study mainly the "internal" causes of low quality SMR. They can be eliminated with the introduction of KS UK SMR at the level of a construction organization, main administration or ministry. At the same time, the low effectiveness of KS UK SMR introduced into operations in construction organizations and a lack of desire on the part of many leaders to engage seriously in raising the quality of construction underscore the existence of objective factors in the economic mechanism which promote the continuation of the existing situation.

Here we have in mind the interrelationships of a client with the contractor. Today a client is interested in accepting an object regardless of the degree of its preparation for operations. Indeed the schedules for placing objects in operation are planned for a client and not the schedules for mastering planned capabilities (the normative schedules for mastering capabilities do not have the same mandatory force associated with planned indicators). It appears that the delivery of an object "under key," that is, fully prepared for operations and with a considerable coefficient for mastering capability, forces a client to be somewhat more exacting when accepting an object and also in the computations with the contractor. In those instances where the turning over of an object "under key" is considered for one reason or another to be irrational, planned schedules for the mastering of capabilities should ideally be established for the client. From an economic standpoint, this will prompt the client into raising the requirements with regard to the quality of construction, the equipment to be delivered and the planning and estimates documentation.

The existing economic relationships between participants in construction could have a considerably greater effect on raising the quality of objects placed in operation if the obvious discrepancies could be removed from the normative and administrative documents. For example, the date established by Decree No. 695 of the CPSU Central Committee and the USSR Council of Ministers dated 12 July 1979 for providing the PSD /point for the gathering of reports/ with the planned annual work volume on 1 July of the current year was not coordinated with the date for presenting requests for logistical resources -- 15 June of the current year.

A system should also be established whereby the accounting for marketable construction products would include only products accepted by the client. Today there are frequent instances of contractors including in their accounting objects which were accepted by a state committee, on the basis of strong pressure from above, in the absence of acceptance of the client's accounts but with an oral promise to correct all of the defects and unfinished work. It would appear that such a system would force a contractor into devoting serious attention to the causes of defects mentioned above and that the attitude towards SMR quality, which is somewhat disruptive in nature, would be transformed into a most important economic problem concerned with the vital activity of an organization.

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CSO: 1821/155

3 July 1986

CONSTRUCTION PLANNING AND ECONOMICS

BRIEFS

DOMESTIC SERVICES DIFFICULTIES

-- The leaders of the domestic services are already experiencing difficulties at the very first stage, when they have to coordinate their expansion of the branch's productive base with the construction ministries, the main administrative boards and the trusts. The latter ones very hesitantly agree to increase the undertakings of their service in accordance with the given contracted work limits in order to meet the norm. Here is the confirmation. In the past year, subdivisions of the USSR Ministry of Heavy Construction completed 39% of the planned construction work for the Russian Federation Domestic Services Ministry, and 25% for the RSFSR Ministry of Agricultural Construction. During the first 10 months of this year, the indicator for the first mentioned ministry consisted of 58%, and for the second - 35%. The subdivisions of the USSR Construction Industry Ministry, Ministry of Industrial Construction, East Construction Ministry and Main Moscow Regional Construction Office and others do not meet their commitments either. This means that once again millions of rubles will not be assimilated. The delays in the construction of the service facilities raise the costs considerably, they bring about the damage not only to the domestic services, but also to the government. [Excerpts] [Moscow PRAVDA in Russian 6 Dec 85 p 3] 12247

PRELIMINARY ESTIMATION PROCEDURE--

The article justly notes that the position of the August 22, 1984 No 46-D directive letter from the USSR State Construction Office (SCO) "...regarding the organization of the copilation of the preliminary estimation documentation for the reconstruction and technical reoutfitting of the existing facilities" does not address to the full extent the increased demand in preliminary estimation documentation for the completion of a given work and does not create conditions, that would stimulate the completion of this work by the contracted construction organizations. At the present time the USSR SCO with participation of the interested ministries and departments of the USSR and in agreement with the USSR State Planning Office prepared a more exact copilation of the preliminary estimation documentation procedure for the reconstruction and technical reoutfitting of the existing facilities in accordance with the CC KPSU and the USSR Union of Ministers resolution requirements. In the layout of the new document, the following items are

considered in part: coordination with the main contracted construction organization regarding the task of designing technical reoutfitting projects; decrease in the amount and size of the preliminary estimation documentation for the reconstruction and technical reoutfitting in comparison with the requirements of the existing, normal documentation for the design and other measures. [Text] [Moscow EKONOMICHESKAYA GAZETA No 45, Nov 85 p 16] 12247

CSO: 1821/90

CONSTRUCTION MACHINERY AND EQUIPMENT

UDC 69.002.5

GOSSTROY, MINISTRY PROGRAM TO REDUCE MANUAL LABOR

Moscow MEKHANIZATSIYA STROITELSTVA in Russian No 3, Mar 86 p 11

[Article by V. V. Mozhayev, staff correspondent of USSR Minpromstroy [Ministry of Industrial Construction] Press Center: "For a Reduction in Manual Labor"]

[Text] For purposes of radically reducing the share of manual labor in construction work, USSR Gosstroy, jointly with the construction ministries, is developing the "Special Comprehensive Program for Reducing the Use of Manual Labor" (TsKPRT) for the period up to the year 2000. And a program developed by USSR Minpromstroy will be a component part of TsKPRT. It will be implemented by the introduction of labor-saving technologies, the mechanization and automation of manual processes of production, the progressive organization of work, and an increase in the use of small-scale mechanized equipment.

The ministry is paying great attention to matters of small-scale mechanization. The ministry's Main Administration for the Mechanization of Construction Operations has developed a schedule of new and progressive types of construction-finishing and powered tools that are to be introduced in 1986 and later years.

These include the SO-114A plastering center for the comprehensive mechanization of operations, with a productivity of 4 m³/hr and a delivery distance of 250 meters along the horizontal and 80 meters along the vertical; the SO-164 plastering unit, with a productivity of 0.5 m³/hr and a delivery distance of 80 meters along the horizontal and 40 meters along the vertical; the SO-168 mortar pump for delivering plaster (6 m³/hr); the SO-165 machine for preparing stiff mortars, with a productivity of 2.5 m³, which operates with a compressor and makes deliveries to 200 meters along the horizontal and 80 meters along the vertical; the SO-115 mobile painting center for the integrated mechanization of painting operations, with a productivity of 1,130 m²/hr for glue-based paints; and the SO-178 power disperser for preparing paint compositions made from materials with a viscosity of more than 120, with a productivity of 850-2,000 kg/hr.

To be used for roofing operations: the SO-145 mobile center for laying nonroll roof coatings, with a productivity of 800 m²/hr and a delivery distance of 80 meters along the horizontal and 50 meters along the vertical; the SO-160 machine for applying polymer-bituminous mastics, with a productivity of 10 liters/min (100 m²/hr); and the SO-179 bitumen-cooking boiler,

with a productivity of $1 \text{ m}^3/\text{hr}$, a boiler volume of $0.88 \text{ m}^3/\text{hr}$, and a delivery distance of 80 meters along the horizontal and 50 meters along the vertical.

Sets of SO-177 equipment for working concrete floors by the vacuum method, with a productivity of $45 \text{ m}^2/\text{hr}$, and the IE-10379 and the two-speed IE-1208E double-insulated electric hand drills will also be used at the ministry's construction projects. They were developed jointly with specialists of the People's Republic of Bulgaria.

These will also yield great savings in labor expenditure: the IE-1806 drill for boring holes in reinforced concrete, with a maximal drilling diameter of 160 mm; and the IE-2011 straight double-insulated grinder, with a grinding diameter of 150 mm.

Also to be used at construction projects are the more productive and higher powered IE-5504 and IE-5506 nibble shears with a maximum cutting thickness of 1.5-3.5 mm of sheet, and the vibrationfree IE-3121A and IE 3122 electrical powered nut driver, with impact energies of 16 and 100 J.

Of great assistance to construction workers will be the introduction of a new semiconductor frequency converter for the feed of high-frequency electrical powered tools. This converter has a service life 5-fold to 6-fold that of previously used ones.

In addition to those named above, the branch will develop and apply successfully a large number of other highly productive sets of small-scale powered machines which will help to reduce still more the share of manual labor and will hasten the construction pace. All the efforts of a mammoth army of efficiency experts, inventors and designers are now aimed at solving this fundamental problem.

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CSO: 1821/136

CONSTRUCTION MACHINERY AND EQUIPMENT

BRIEFS

MINGECHAUR-MADE BULLDOZERS DELIVERED--Mingechaur--The builders of Azerbaijan, Armenia and Georgia have received the first lots of new bulldozers produced at Mingechaur's Dormash plant. They were created on the base of the widely known DT-75 tractor, which the plant obtains from Volgograd. The road-machinemakers manufacture the toolbar equipment with their own resources. [T. Grigalashvili] [Text] [Moscow STROITELNAYA GAZETA in Russian 2 Feb 86 p 3] 11409

VORONEZH-PRODUCED DRILLING MACHINE--Voronezh--The BM-4001 drilling machine has been produced by the Excavator Plant imeni Komintern at Voronezh. It will become a reliable assistant to the builders during the new five-year plan. A problem of basic importance has been solved: the drilling of slant holes with the installation of five piles will help to raise the load-bearing capability of the structure by up to 50 percent. The new method is economical, since it reduces the number of piles used by 30 percent. [N. Tarasenko] [Excerpts] [Moscow STROITELNAYA GAZETA in Russian 5 Jan 86 p 3] 11409

CSO: 1821/136

CONSTRUCTION METHODS AND MATERIALS

UDC 678.002.237

PLANS FOR PRODUCTION, USE OF POLYMER CONSTRUCTION MATERIALS

Moscow STROITELNYYE MATERIALY in Russian No 3, Mar 86 pp 6-9

[Article by A. F. Poluyanov, Candidate of Engineering Sciences and General Director of the NPO Polimerstroymaterialy [Science and Production Administration for Polymer Building Materials], and M. P. Makotinskiy, Candidate of Architecture (VNIISTROYPOLIMER [All-Union Scientific-Research Association for Polymer Building Materials]): "Prospects for the Production of Polymer Building Materials"]

[Text] The draft of the Main Directions for Economic and Social Development of the USSR During 1986-1990 and Up to the Year 2000 called for a rise in the level of capital construction to a qualitatively new level, further industrialization of construction operations, and an expansion of the variety of and a buildup in the output of more economical types of basically new chemical building materials. Implementation of a set of measures for improving the technology for producing these materials, for expanding 1.5-fold to 2-fold the use of progressive basic technologies, and for making more complete use of the potentials of materials, including synthetics, with previously tailored qualities, during the development of new equipment and technology, is proposed.

Development of the production and use of polymer building materials that will enable the weight of buildings to be greatly reduced, the level of industrializing their construction to be raised, and labor intensiveness to be reduced is of especially great importance to the plan for realizing these tasks and for implementing the principles of the CPSU Central Committee and USSR Council of Ministers decree, "Further Development of Industrialization and Rise in Labor Productivity in Capital Construction."

Modern construction is relying upon a high-capacity supply and equipment base, but, along with the successes achieved in prefabricated construction, there are also deficiencies. To a great extent these are caused by the use of materials that do not provide the required quality of waterproofing, sealing, heat insulation, and finishing work. In such a situation, plastics take on the role of materials that will enable the indicated deficiencies to be avoided and higher quality of the buildings and structures being erected to be guaranteed.

The wide development of polymer building-materials production results from the simplicity in converting raw materials into articles and relatively small

specific capital expenditures. Polymer materials and articles combine such properties as lightness of weight, strength, good thermal insulating capability, impermeability to steam-gas, chemical stability, elasticity and, if necessary, translucency. Moreover, plastic is a good dielectric, is not subject to corrosion and does not require additional finish.

Decorating materials and decorated structural materials based on polymers can be produced today over a wide variety of colors, patterns and surface textures, opening up major opportunities to architects and affecting positively the aesthetics of the buildings and structures being built. Plastics do not rot, as does wood, where moisture varies. They are severalfold lighter than metal, they do not corrode, as does metal, and, unlike silicate glass, they transmit ultraviolet rays. They have specific strength (that is, the ratio of strength to average density) that is higher than that of materials that are similar in purpose, and high waterproofing and heat-insulating properties.

Polymer materials lend themselves well to manufacture: they can take on previously assigned characteristics, shapes, colors and patterns, that is, their physical and mechanical properties, architectural and constructional characteristics and aesthetic qualities can be programmed. The acquisition of materials with previously prescribed properties and full preparation at the factory are called for by both the Main Directions and the decree mentioned above.

The use of polymers as the basis for producing effective building materials and articles is quite widespread in all developed countries.

Information that has been gained about the technical and economic effectiveness of using polymer building materials in fields expedient for their use indicates that construction has emerged as one of the largest consumers of synthetic raw materials.

In our country, 10-12 percent of all polymers are consumed in construction, whose requirements for which are being met by no more than 35-40 percent. So the increase in the production of synthetic resins and plastics called for by the Main Directions for 1990 is extremely important.

The production of materials for polymers in the next 5 years is being planned in accordance with the desirable areas of use of polymers in construction, taking into account the volume of shipments of chemical raw material. World practice discloses extremely diverse areas for using polymer building materials, from floor coverings and interior decorating to completely plastic housing.

The widest use has been made of polymer materials in combination with traditional materials in fully prefabricated buildings and in other types of construction: for covering floors, internal decoration, sealing joints, waterproofing foundations and roofs, thermal insulation, and the manufacture of sanitary-engineering and builtin equipment. At the same time, plastics have been used for a number of years for enclosure and box members of buildings (this, in turn, leads to a change in traditional structure and of architectural shapes). Such members include lightweight three-layer suspended

wall panels, inner partitions, doors, window sash, translucent skylights and domes, bathroom boxes, small architectural figures, rural cottages, small collapsible housing for northern regions, and pneumatic constructional structure.

Let us take a look at the areas of application of polymer building materials.

Floors. Materials and articles for covering floors are manufactured in the form of roll materials and tiles, as well as of cementing and polymer cementing compositions for jointfree (monolithic) coverings.

The economic effectiveness of using polymer coatings for floors instead of the traditional wooden and parquet flooring lies in the reduction of labor-intensive work (by more than 50 percent) and a substantial reduction in the consumption of wood. Thus, by substituting synthetic flooring for board floors in an 80-unit apartment house, about 300 m³ of lumber are saved. Moreover, capital investment for organizing production of the floor materials and the one-time costs for laying them are reduced. It is planned to double the production of polymer materials for covering floors by 1990.

Polyvinyl chloride is the most widely used floor covering. Four types of output are produced on the basis of polyvinyl chloride: roll covering material for heat-insulating underlayment, roll materials for fabric underlayment, roll materials without underlayment, and floor tiles. These comprise about 70 percent of all polymer materials manufactured for floors.

In completely prefabricated industrialized production with reinforced-concrete ceiling-floors, polyvinyl chloride roll coverings for thermal-insulating underlayment as well as coverings based upon chemical fibers are extremely effective. These are laid directly on the reinforced-concrete panel of the ceiling floor, providing, in so doing, the necessary thermal and sound insulation under the floor without the involvement of labor-intensive and expensive preparation of the thermal and acoustic insulation.

New studies and experimental work on obtaining effective coverings for floors based upon polyvinyl chloride are being performed in two directions. The first is development and organization of the production of materials for porous underlayment or the nonporous type. These have a number of advantages (manufacturing and operational) over nonfabric-fiber underlayments now in use. Second is an increase in the width of the roll covering (up to 4 meters), thanks to which major industrialization of the construction work is achieved and the variety of colors, patterns and textures that are applied by means of polyvinyl chloride pastes is expanded. There is an elastic, porous filler between the load-bearing layer and the facing layer with the embossed texture.

VNIISTroyopolimer has completed the development of theses on the creation and mastery of the industrial-test production of polyvinyl chloride linoleum on industrial lines with a productivity of 10 million m² per year. During the 12th Five-Year Plan several such lines will be turned over for operation. Experimenters are faced with the task of developing new types of polyvinyl chloride coverings for various operating conditions and also of expanding the production of various roll coverings made of chemical fibers.

Polyvinyl acetate mastic compositions can be used in those premises of industrial and social buildings where the floors are subjected to a relatively light mechanical action. Floors made of polymer cement compositions are laid in places where moderate mechanical loads may be placed on them.

The intended increase in shipments for the construction of polyvinyl-acetate dispersion and divinylstyrene latex, and also of compounds based upon epoxide resins, will promote wider use of jointfree floors.

Finishing Materials. Roll materials--polyvinyl chloride film--are used widely for finishing work. They are obtained in any color and pattern and with smooth or embossed surfacing. They can have a glued layer (with protective paper backing) and an underlayment made of paper, fabric and acoustic material. The film is also manufactured without underlayment and without the glue layer, and they are translucent or semitransparent, thanks to which they can be used as light-transmitting materials. The production of decorative polymer film is to be increased 2.5-fold by 1990.

The group of construction-finishing materials includes sheet and tile. Decorative paper-layered plastic material is used for the facing panels of the walls of social buildings, for door leaves, for built-in equipment and for bathroom booths. Walls and ceilings are faced with opaque rigid polyvinyl chloride sheet with a raised pattern; and window openings are filled with uncolored transparent and toned semitransparent plastic. It is used in the installation of upper illumination. Impact-resistant and atmosphere-resistant materials based on polyvinyl chloride, modified by chlorinated polyethylene, serve in outside facings, balcony enclosures and window sash.

Partitions, doors and built-in furniture made of particleboard, faced with synthetic film or paper-resin coatings, are being installed.

Five-year plan tasks call for a great increase in the production of paper-layer plastic materials.

Linear Articles. Playing an important part in construction are linear-shaped articles--baseboards, railings, stair-tread cover plates, trim, battens and section for fastening and finishing sheet and rolled facing materials and for decorating joints in large-panel buildings. These are manufactured mainly from polyvinyl chloride. Elastic caulking strip for windows, doors, and glass cases are made from this same polymer and also from polyurethane and rubber. It is planned to increase greatly the production of linear shaped products by the end of the five-year plan.

Materials for Structure. One of the most progressive polymer materials of this group is glass-reinforced plastic. Nontransparent, colored glass-reinforced plastic sheet can serve as the outer layer of three-layer wall panels. Uncolored transparent or glass-reinforced plastic or colored and, for the most part, semitransparent plastic are used for the installation of translucent roofing, skylights, plafonds and artificial illumination, for filling openings and for the enclosure of balconies and staircases. Acrylic plastic (polymethylmethacrylate) is used for this same purpose and

also for the manufacture of illuminating cupolas. The production of glass-reinforced plastics and of acrylic plastic for construction purposes is to be increased.

Thermal Insulating Materials. The weight of buildings is sharply decreased and their energy effectiveness is raised through the use of polystyrene phenol and polyurethane foams for thermal insulation. They serve as the heat-insulating middle layer of wall panels for buildings, in combination with various outside layers (reinforced-concrete, metal and plastic), and also for the insulating layer of roofing in buildings designed for various purposes.

Compositional foams which are obtained by the introduction of porous granulated mineral fill and whose use enables polymer raw-materials consumption to be reduced, the properties of the foams to be regulated directionally, and the strength, flame resistance and stability of shape to be raised, are being created through developments by VNIISTroyopolimer. Goals for this five-year plan call for a 2.5-fold increase in foam production.

Sealants. The problem of sealing butt joints reliably arose with the development of large-panel housing construction. Sealing compounds that do not harden but are cured have been put to use. For the first time, sealants based upon high molecular weight compounds (butyl rubber, ethylpropylene rubber and polyisobutylene) are being used widely in construction. At the Otradnyy combine Polimerstroyaterialy, VNIISTroyopolimer has created and adopted for industrial-test production an industrial line for nonhardening sealants that has a productivity of 5,000 tons per year. This mastic can be in operation over a broad temperature range. Its production is to be increased greatly by the end of the five-year plan.

The production of cured sealants based upon thermoplasts and other materials is to increase almost 6-fold in five years.

For roofing and waterproofing operations, wide use is being made of materials based on bitumens: ruberoid, including glass-reinforced fiber, and gidrozol (asbestos board impregnated with bitumen). The laying of roofing with sprays based on polymer mastic or modified polymer bitumens is promising. Such a method saves labor expenditure and capital investment, since the manufacture of roll materials is precluded. During this five-year plan period, it is proposed to increase 5-fold the production of one of the most effective roofing materials--glass-reinforced ruberoid. The production of polymer roofing (mastic and roll) will increase almost 8-fold.

Sanitary-Engineering Articles. The use of plastic pipe has been spread widely in water-supply and sewerage systems. Its virtues are resistance to corrosion and lightness of weight. Baths, lavatories, siphon drains, faucets, mixers and other sanitary-engineering articles are being made of plastic decorated in various colors. The plastic pipe and pipeline parts, together with compression gaskets, that are received, are to increase almost 30 percent by the end of the five-year plan.

Paints and Varnishes. Goals for deliveries for construction call for the production of water-based paints to be doubled, of rapid-drying alkyd modified

paints and varnishes to be increased 10-fold, phosphate water-based anticorrosion coatings 3-fold, by 1990.

Mastics. For the application of rolled materials, tiles and sheet, polymer mastics (rubber, dispersion and latex mastics) are used. The industrial production of gluing mastics that VNIISTROYPOLIMER developed at installations with a productivity of 5,000 tons per year is being readied for assimilation.

Structure. Among the three-dimensional structure made of polymer materials, prefabricated sheathing and monolithic structure--folded, tent and pneumatic--are of interest. By the end of the five-year plan, about 900 structures are to be built from rubber-fabric and film-fabric structure, for which almost 3 million m² of special fabrics should be manufactured.

Work is being done on the application of plastics to fully prefabricated panel and box-module construction. In particular, VNIISTROYPOLIMER has developed and constructed a line for the manufacture of three-layer wall panels with the internal layer made of porous plastic, for prefabricated construction.

The shortage of polymer resins, their relatively high cost even today, the poorly studied questions of their durability and creep, and the sanitary and fire risks--all these restrain the wide introduction of structural plastics and the erection of entirely plastic housing, which still has not gone beyond the framework of more or less widely staged experiments. Existing experience requires a comprehensive evaluation. The specific functions and the desirable range of applications of polymers must be refined. Neither the results of the use of polymers nor the potential new areas of their application has been studied adequately yet. A number of thorough scientific-research and experimental operations, mainly on fire resistance and durability, should be performed along the road to the wider introduction of polymers into construction work.

The creation of new polymer materials and structure for construction will promote more rapid solution of the tasks set forth in the CPSU Central Committee and USSR Council of Ministers decree, "Further Development of the Industrialization of and Increase of Labor Productivity in Capital Construction," particularly in regard to raising construction's technical level, effectiveness and quality.

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CONSTRUCTION METHODS AND MATERIALS

PRICE FORMATION FOR LOCAL CONSTRUCTION MATERIALS

Moscow ZHILISHCHNOYE I KOMMUNALNOYE KHOZYAYSTVO in Russian No 3, Mar 86 pp 18-19

[Article by V. P. Litovchenko, candidate of economic sciences: "Price Formation for Local Construction Materials"]

[Text] Prices for local construction materials, parts and structures are among the most important aspects of the system of standard estimates used to determine the cost of repair of buildings and structures. Estimated prices determine standard expenses for materials at the on-site construction site warehouse.

It should be noted that the cost of local materials (brick, lime, sand, stone, crushed stone and gravel); intermediate products (slurry and commercial concrete) and building structures (reinforced concrete, concrete and metal), including delivery costs constitute more than half of all the expenditures for construction materials.

The use of a pricing system in planning repair production must help to increase the level of balancing of all projects and the material resources which are consumed, and must strengthen the influence of economic levers on the production process and its results.

At present the role of prices is increasing significantly as a social norm for the expenditure of material, labor and financial resources per unit of construction production, and on reducing its material intensiveness. In connection with this, improving the repair production planning system is inseparably linked with further improving price formation, which is called upon to support cost accounting conditions in the activity of associations and enterprises.

As is known, since 1984 there has been a shift in construction practice to new estimated norms and prices, which are intended to determine the estimated cost of construction and of planning capital investments.

The new standard estimates take into account wholesale prices for industrial products; charges for automotive transport; estimated prices for loading and offloading and the price increases for supplying and marketing organizations

put in effect on 1 Jan 82. This measure resulted from the need to consider those changes in equipment, technology and organization of construction production which took place during the past 10-12 years. One must also not overlook changes in the pattern of delivery of materials to regions of the country, the increased amount of construction projects in rural areas and higher capital investments in the eastern and northern regions of the country.

The basing of prices on local construction materials, goods and structures is also not unimportant. Its importance stems, first, from the share of expenditures for this group of materials in the estimated cost of construction, assembly and repair projects (up to 35 percent) and, second, from the great variety of conditions of production and transport of local construction materials in different areas of the country.

Determining estimated prices for local construction materials takes place in the following main stages: the conditions and distances for the delivery of materials are disclosed and their transport networks are arranged; delivery prices are determined; and calculations of estimated prices are compiled.

In determining the sources to meet the needs for local construction materials, goods and structures it is very important to take into account the capabilities of the material and technical base. Expenditures for transport of local materials are calculated in accordance with standard calculations. New estimated prices for delivery by various types of transport and for loading and offloading work are used.

Information about sources of local construction materials, as well as about delivery quotas for individual enterprises is determined through balanced calculations. The planning institution, with the participation of leading repair organizations determines the conditions and distances for the delivery of materials.

Repair and construction trusts participate directly in the work of the first and second stages.

We have examined the procedures and organization of this work in the trusts of USSR Minstroy [Ministry of Construction], USSR Minpromstroy [probably Ministry of Industrial Construction] and USSR Minselstroy [Ministry of Rural Construction]. Estimating and contracting trusts, along with the departments (production and technical, main dispatcher, material and technical supply) work out initial data to determine new estimated prices for local materials.

First, delivery distances are measured and their flow sheet in the area of construction is compiled, with distances of delivery of materials from the central base to the sites indicated. Then sand and gravel quarries are selected. In doing this it is very important to make an adjustment of the suppliers of local materials.

Sometimes it may be more appropriate to increase their numbers. This may be caused, for example, by an expansion of the group of clients and of the number of sites being repaired.

In carrying this out, all materials are made known to the planning institution, which calculates transport expenses based on the transport flow sheets. I would like to direct attention to the fact that sometimes inaccuracies in calculations are permitted; for example, the amount of delivery of some precast reinforced concrete elements is determined without taking into account the transport flow sheets, and the delivery of parts for large-panel residential construction is not fully anticipated. It also happens that crushed stone for the site is delivered from the facilities of a gravel crushing factory, although it could have been obtained from the nearest quarry. All of this indicates that repair and construction trusts must carefully check the correctness of their calculations.

Reducing the material intensiveness of repair production requires further improving the system of price estimation to more fully reflect socially necessary labor expenditures and increasing the effectiveness of production of local construction materials, having in mind reducing final expenditures per unit of use value.

It should be noted that the policy of reducing estimated prices does not exclude maintaining them at a stable level during a particular planning period. It signifies merely the need for a constant decrease in expenditures for the manufacture of products and for their delivery to the consumers.

An important aspect of reducing the material intensiveness of repair production is improving the technical economic indices at the planning stage. Therefore, the development of progressive per-unit indices of material intensiveness by project should be accelerated and they should be included in plans for raising the technical level of the repair and construction trusts.

At present estimated norms remain in effect 10-13 years. Such a lengthy period in which unchanged prices are used for local construction materials causes them gradually to lose contact with the conditions and level of expenditures on which they were based. This gap is especially noticeable in the extreme north, Siberia and the Far East. Therefore, cost reductions for production of materials and their delivery to repair organizations are not reflected in a timely way in planning and estimating documentation, and they are taken into account only in the plans for the profits of contracting organizations. Solving this problem will help to reduce material intensiveness and the per-unit cost of construction production.

To increase the amount of production of local construction materials and of enhanced quality structures it would be useful to carry out a redistribution of profits obtained by contracting organizations as a result of introducing materials and enhanced quality structures. The disclosure of additional reserves for saving material resources and their reflection in plans for organizational and technical measures will make it possible to improve the effectiveness of repair production.

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CONSTRUCTION METHODS AND MATERIALS

MOSCOW HOSTS INTERNATIONAL CONFERENCE ON INSULATION PANELS

Moscow STROITELNAYA GAZETA in Russian 14 Feb 86 p 2

[Article by G. Dmitriyev: "Guaranteed Heat"]

[Text] A seminar took place in Moscow at the center for international trade and scientific and technological relations with foreign countries on questions of the production and use in construction of highly effective insulation panels. The British firm, (Kosli) Insulation Products, acquainted Soviet specialists with their achievements in this field.

Does an overcoat warm? It simply preserves our heat, preventing it from being dissipated. Houses are "heated" similarly, except that they are made of, let us say, claydite-concrete and their heat conductivity is much higher. Due to the high coefficient of heat transfer a large percentage of the heat escapes from the premises. In order to preserve the microclimate in winter, for example, it is necessary to burn thousands of tons of coal and fuel oil, which are in short supply, in heating furnaces. That is why today, when throughout the world the strictest economizing of fuel and energy resources is being introduced, one of the central tasks facing construction organizations and firms is to seek new effective thermal insulating materials and to create from them high quality enclosing structures, which can preserve heat with the lowest fuel expenditures.

The developments proposed by the British firm, (Kosli) Insulation Products, may serve as one of the ways of solving this urgent task. "At the seminar," stated Mr. (Hebblewhite), the head of the firm, "we acquainted our Soviet colleagues with our product, three layer, 'sandwich' type thermal insulation panels, having an outer lining layer. The panels are primarily used to jacket the outer walls of buildings. Houses are wrapped as in an overcoat, which improves their thermal insulating properties.

"Depending on the requirements of clients and the specific climatic conditions we use zinc-coated metallic sheets or plates of cement chips for the outer layer, and use polyurethane, polystyrene, mineral wool and other traditional insulating materials for the inner layer."

The Soviet specialists assessed highly the merits of the firm's product. The thermal insulating panels are light, cheap, and while reducing the expenditure

of fuel for heating almost in half, retain a comfortable temperature in the premises, and have a lengthy guaranteed service life of up to 70-80 years. Technologically their assembly is very simple. Owing to specialized mounting structures an ordinary five-story house can be dressed in a "sandwich overcoat" by a brigade of 5-7 men in a few weeks. And that is all. The "warm clothing" lets in virtually no moisture or dust and can be colored according to any tastes.

"Our firm," stated Mr. (Hebbletwhite) in parting, "is acquainting its Soviet colleagues for the first time with its achievements. We are happy to see the interest displayed toward us and hope to have a business partnership. It is very important that mutually advantageous cooperation develop between our countries. It is necessary to take care not only to see that it is warm in our individual houses, but also that it is warm on this planet, our common home."

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CONSTRUCTION METHODS AND MATERIALS

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TECHNICAL PROGRESS, TASKS IN CEMENT INDUSTRY

Leningrad TSEMENT in Russian No 1, Jan 86 pp 6-7

[Interviews with Yu.V. Nikiforov, Candidate of Technical Sciences and deputy director for scientific matters of the All-Union State Scientific Research and Planning Institute of the Cement Industry and A.I. Zdorov, Candidate of Technical Sciences and deputy director for scientific work of the State Institute for the Planning of Cement Plants in the Southern Regions of the USSR; date and place not specified]

[Text] The journal TSEMENT continues to publish responses to the editorial board's questionnaire on the question of accelerating scientific-technical progress in the cement industry.

In this issue of the journal, we hear from Yu.V. Nikiforov, Candidate of Technical Sciences and deputy director for scientific matters of the All-Union State Scientific Research and Planning Institute of the Cement Industry and A.I. Zdorov, Candidate of Technical Sciences and deputy director for scientific work of the State Institute for the Planning of Cement Plants in the Southern Regions of the USSR.

They provide answers for the following questions:

1. What were the most effective scientific works of the institute introduced into production during the 11th Five-Year Plan?
2. On what problems is the institute's collective working in the interest of accelerating scientific-technical progress in the branch?
3. What must be done in order to raise the creative activity of the scientific workers?
4. What is preventing a more rapid introduction into production of scientific works and inventions and how can the barriers in this regard be overcome?

Response by Yu.V. Nikiforov

1. Giprotsement [All-Union State Scientific Research and Planning Institute of the Cement Industry] is constantly striving to develop a dry method for cement production, to raise its effectiveness and to introduce works aimed at achieving economies in the use of fuel-energy resources.

One such innovation is that of a heat-exchanger of the mining-cyclone type for furnaces measuring 4 X 60 meters. The unit is operated from Furnace No. 3 of the Katav-Ivanovsk Plant and it was adopted by an inter-departmental committee and recommended for production at the PO Volgotsenmash.

The operation of the mining-cyclone heat-exchanger is intensified through the use of a system for additional gas combustion in a mine and this makes it possible to increase the productivity of a furnace unit of this size by 40-45 percent compared to the planned figure.

In accordance with a request by Giprotsement, VNIItsemmash is preparing the technical documentation for a system for the homogenization of raw meal in mixing silos measuring 6, 12 and 18 meters, the principal elements of which are ceramic aero-bottoms and automatic air-distributors developed by our institute. The experience in the operation of this equipment at the Lipetsk, Novokaraganda and Novospasskiy cement plants underscores the reliability and effectiveness of the units: reductions take place in the time required for mixing the raw mixture and in electric power consumption. Industrial models of such air-distributors have been produced and are undergoing testing at the Krasnogorsk Tsemmash Plant.

On the 6th technological line of the Karagandatsement PO, a new system for the continuous homogenization of raw meal is in operation on an experimental-industrial basis.

At the Spassktsement PO, flow dividers have been introduced and are being operated successfully on the cyclone heat-exchangers of furnaces and also chain shut-off devices in the spouts of cyclones, which are distinguished by a raised effectiveness and reliability and also which make it possible to save approximately 700 tons of conventional fuel annually on one furnace unit.

On a domestic dry self-grinding mill, use is being made of a classifier for milled raw material. Designed by Giprotsement, it has lowered energy expenditures from 26.1 to 20.0 kilowatt hours per ton.

Jointly with VNIIpromgaz [All-Union Scientific Research Institute of Gas Utilization in the National Economy and of Underground Storage of Petroleum, Petroleum Products and Liquefied Gas], our institute has developed a gas burner GRTs [generator of equally probable digits] for the principal sizes of rotating furnaces, one which ensures a gas combustion with a coefficient of surplus air of 1.05. The burners have been installed on 35 rotating furnaces and all furnace units being produced at the Volgotsenmash PO.

Since 1982, a single-channel controlled burner has been in operation on a furnace measuring 5 X 185 meters at the Akmyantsementas PO for the efficient

burning of mazut. It conforms to the best world standards and it ensures a reduction in fuel consumption of 1.5 percent. The inter-departmental committee adopted and recommended the burner for series production

Giprotsement recommended the use of a unit lining made out of heat resistant concrete on liquid glass, introduced into operations at the Bryansktsement and Sukholozhsktsement PO's and also at the Lipetsk Plant.

Light series production of the units (up to 10 sets annually) has been organized at the institute's experimental plant. A design has been recommended which automatically regulates the delivery of compressed air into a tank depending upon the sludge level and which ensures an optimum consumption for it. The unit is in operation at the Bryansktsement PO, with the consumption of compressed air for homogenization having been reduced by 20-30 percent.

At the Katav-Ivanovsk, Kuznetsk and Punane Kunda cement plants, Giprotsement has introduced gravitational-pneumatic units for use instead of pneumatic-conveyer and chamber-pumps. These units reduce electric power consumption for delivery of raw materials by 1.0-1.5 kilowatt hours per ton and that for compressed air -- by 10-30 cubic meters per ton.

Pneumatic-transport supply units in three sizes have been developed and introduced into operations for regulating the delivery of raw meal from service tanks directly to the heat-exchangers of furnace units over a distance of up to 200 meters and to a height of up to 70 meters. Prolonged experience in the operation of these units at the Katav-Ivanovsk, Navoi and Bezmeni plants reveals that the units are of simple design, they simplify considerably the system for delivering the raw meal and they make it possible to reduce the number of service personnel and the consumption of electric power by 2-4 kilowatt hours per ton of raw meal and compressed air -- by 20-40 cubic meters per ton.

These units have undergone inter-departmental testing and have been recommended for series production at the Volsk Metallist Plant.

2. Based upon the operational experience of the system for additional burning of fuel at Furnace No. 3 of the Katav-Ivanovsk Plant, the institute is striving to create a system for the preliminary decarbonization of material in the heat-exchanger of a furnace measuring 7.0/6.4 X 95 meters. The system is being developed for the Novospasskoye Plant, but in the future it could be used on technological lines of the Novokaraganda, Navoi and Rezina plants.

The institute's workers have completed a large volume of accounting materials and they have developed design solutions for converting the technological lines for the wet method over for use with the dry and semi-dry methods.

Giprotsement is striving to create an efficient burner for the burning of solid fuel and a gas-mazut burner for the furnace units of powerful technological lines.

A system of continuous homogenization of raw meal is being created for a line with a capability of 3,000 tons of clinker daily at the Nevyansk Plant. This system intensifies the process through use of the residual energy of compressed air following transport.

3. The creative activity of a scientific worker depends to a considerable degree upon the individual qualities of the specialist and thus the development of his professional capabilities should be promoted by further specialization.

Throughout the entire period of specialist work, special attention should be given to raising the prestige attached to his activity.

4. The absence of direct interest in introducing new equipment which basically changes the technological process is explained by factors from among which the following have been singled out:

...a system for planning the principal indicators with regard to those already achieved; an enterprise must have a reserve in accordance with indicators achieved through the introduction of new equipment and it must exercise discretion in using it in the interest of renovation, repair and modernization;

...vagueness and ineffectiveness of a material incentive system; the engineering and technical workers of enterprises should ideally be awarded bonuses only for fulfillment of a plan for the introduction of new equipment and only a small portion of a bonus should be issued for fulfillment of a production plan.

As a rule, a low level of completeness of scientific works is explained by the absence of an opportunity for carrying out industrial checks on them. I believe that the reasons for this abnormal phenomenon are understandable. Such a stage in the completion of work is required in connection with the conditional nature of simulation of the principal technological processes in the branch.

Under existing conditions, this can be overcome through the creation of scientific-production collectives "for a specific task," that is, through the withdrawal of branch institutes from a purely laboratory structure. The system for forming such collectives is new, complicated and organizationally difficult and yet it must be tried.

Solutions are required for many questions concerned with organizing the introduction of innovations. These solutions must be formulated in an accurate manner and they must be reinforced with the necessary capital investments, personnel and appropriate schedules.

The transfer of works over to enterprises for introduction must be carried out through mediation with the specialized department for new equipment of the main administration. The staff of such departments must consist of exceptionally highly qualified specialists, individuals who possess directive authority and their operational indicators must be associated only with the quantity and effectiveness of the measures introduced.

For the rapid carrying out of scientific-research works, special importance must be attached to the inter-branch systems for introduction, which also possess directive authority. The existing all-round special purpose programs cannot replace the plans for introduction that are controlled by special departments.

The requirements for the intensification of industrial production, advanced during the April (1985) Plenum of our party's Central Committee and during a

meeting in the CPSU Central Committee in June 1985, can be carried out only on the basis of reorganizing the system for introducing scientific-research and experimental-design works into operations and changing the system of material incentives for workers attached to cement enterprises.

Response by A.I. Zdorov

1. During the 11th Five-Year Plan, effective works by Yuzhgiptsement on energy conserving technologies included the following:

"R-roasting" clinker, which ensures a reduction in fuel consumption of 8-10 percent, an increase in the productivity of furnace units of 8-15 percent and an increase by a factor of 2.5-3 in the stability of a lining; for non-standard technological systems, the "R-roasting" was introduced on a furnace with cyclone heat-exchangers of the Lipetsk Plant and at the Akmyantsementas PO; the plans call for the introduction of this new technology at the Karachayevo-Cherkessk, Navoi and other cement plants;

...the method of additional supply for furnaces with a cold end and non-pulverized slag, with a reduction of 1.0 percent in the material introduced, 0.8 percent in specific fuel consumption and 0.2 percent in electric power consumption; this innovation was introduced into operations at the Bakhchisaray and Kramatorsk cement combines and the plans call for its use at still five more cement enterprises in the Ukraine;

...sulphate-stable slag Portland cement, including on acid slags; the mastering on an extensive scale of the production and use in construction of this astringent in 1983 is associated with awarding of the prize of the USSR Council of Ministers;

...obtaining special cement for the waterproofing of Tayugtsem wells, which reduces by a factor of seven the requirement for astringent and which reduces considerably the overall amount of time required for tamping down; the production of Tayugtsems was developed by an experimental plant of the institute and the economic effect from its use and the technology for dry tamping down amounted to approximately 1,000 rubles per ton of cement;

...the extensive use of polymer coverings for preventing the sealing of plastic materials on sections of the raw material processing stage; this innovation was introduced at the Balakleya Cement-Slate Combine, the Krivoy Rog and other plants and it lowered substantially the laborious nature of the work concerned with ensuring the working efficiency of the technological lines, particularly in connection with the dry production method;

...utilization of the heat losses of rotating furnaces; this will make it possible to ensure a heat output from one unit, on a furnace measuring 5 X 185 meters, of approximately 20,000 gigacalories annually, to save approximately 2,000 tons of conventional fuel annually and to raise the stability of a lining by 30-50 percent; two YuGTs-VER units have already been introduced into operations on furnaces at the Novorostsement Combine and installation work is being completed on two more units at the Kamenets-Podolsk Cement Plant and the Balakleya Combine.

2. Yuzhgiprotsement continues to work on the following problems:

...raising the quality of cement while simultaneously lowering its production cost by economizing in the use of material resources;

...developing a technology for preparing raw material mixtures and roasting, with use being made of the dry production method and various types of fuel;

...expanding the use of technogenic industrial waste products for use as additives in raw materials and cement;

...increasing the productivity of raw material processing stages of plants using the wet production method;

3. A chief factor for raising the creative activity of scientific workers -- creative use of the 22 May 1985 Decree of the CPSU Central Committee and the USSR Council of Ministers entitled "Improvements in the Wages of Scientific Workers, Designers and Technologists of Industry." The new system presupposes scientific competition, which with sound control being exercised over the use of labor evaluations and publication of them, will ensure a substantial increase in the effectiveness of scientific works.

4. Experience has shown that the following circumstances hinder the accelerated introduction of scientific works into production:

...the conditions required for the working out of new technological processes are lacking at enterprises; even those of innovations which were tested at an experimental plant of the institute require finishing off on industrial units; here it should be mentioned that indicators for an industrial enterprise are being planned for our experimental plant and this is inhibiting the priority carrying out of scientific-research work;

...the system of material incentives for developers of new equipment is inadequate; it is no secret that several years are required for the creation of effective solutions and that during this period the creators of such equipment do not receive any bonuses; withholdings for the economic incentive funds must be dependent directly upon the effectiveness of a new development introduced into operations;

...a system for computing the effectiveness of incentives for introducing scientific developments into plans is lacking; a statute has still not been developed for all-round scientific-research and planning organizations which have proven their effectiveness; thus, within Yuzhgiprotsement there are various criteria for evaluating the work of subunits and also various systems for awarding bonuses, which for all practical purposes eliminate incentives for scientific workers for the introduction of new equipment in the plans for plants undergoing construction or modernization.

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PROBLEMS IN WIDE USE OF SECONDARY MATERIAL RESOURCES IN CEMENT INDUSTRY

Leningrad TSEMENT in Russian No 8, Aug 85 pp 1-3

[Article by T.V. Kuznetsova, Doctor of Technical Sciences, Professor, Moscow Institute of Chemical Technology imeni D. I. Mendeleev]

[Abstract] Many scientists have studied the possibility of using metallurgical slag, power plant wastes and the wastes of mining and beneficiation of plants as raw materials and additives for the cement industry. The use of secondary resources has been shown by experimental and pilot-scale development work to be a suitable means of modifying the structure of the clinker, increasing its activity and improving the economic indices of cement industry enterprises. Once the wastes used as raw materials are converted to usable form, their processing is virtually identical to that required by natural raw materials. The psychological barrier against using waste materials could be partially overcome by referring to them as side products rather than wastes in their original processes, but the documents which would be required to do this, such as technical conditions, prices, and technological regulations, have not yet been published by the Government, so this cannot as yet be done. The use of wastes from other branches of industry for the production of cement decrease the cost of utilization of cement plants as well as the plants providing the secondary materials. Scientific and technical programs should be instituted to solve remaining technical and organizational problems hindering this utilization of secondary materials by the cement industry. Figure 1, references 7: 6 Russian, 1 Western.

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CONSTRUCTION METHODS AND MATERIALS

UDC 627.825

NEW CONCRETE PLACEMENT TECHNOLOGY SAVES LABOR AT GES SITES

Moscow ENERGETICHESKOYE STROITELSTVO in Russian No 12, Dec 85 pp 11-12

[Article by Engineers Z. L. Machavariani, N. N. Shartava and Candidates of Technical Sciences N. Z. Kolvazov and R. S. Tilies]

[Abstract] The problem of creation and introduction of a technology of continuous concreting of massive structures is quite complex, including the development of a continuous method of preparation of the concrete mixture, a conveyor system for transportation and placement of concrete mixtures moving at up to 5 m/s, the creation of a moveable universal deck for continuous concreting, as well as vibration equipment capable of compacting 200-250 m³/hr or more, the creation of effective systems of heat regulation and massive blocks, investigation of the heat stress state and temperature conditions of concrete, and development of a plan for organization of construction using continuous concreting of large arch dams. A new continuous concreting line has been installed to increase the rate of erection of the left bank buttress of the Ingura Hydroelectric Power Plant. The process line includes a cable way, continuous concrete plant, conveyor transport system and concrete placing unit. The concrete plant includes 3 independent mixes with capacities of 100 m³/hr each, each with 2 conveyors. The major conveyor from plant to dam is 205 m in length, maximum slope 30 degrees, conveyor speed 2.8-5.4 m/s. The concrete placing mechanism is a fully rotating structure with a 19.5 m bidirectional conveyor. The continuous technology has been used to place 127,000 cubic meters of concrete in this portion of the dam. Good economic results have been achieved, in spite of the fact that the pouring rate is at the lower end of the effective range of rates for this technology.

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CONSTRUCTION METHODS AND MATERIALS

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PROGRESSIVE LIGHT-WEIGHT COMPOSITE TUNNEL LINING

Moscow ENERGETICHESKOYE STROITELSTVO in Russian No 12, Dec 85 pp 33-34

[Article by Doctor of Technical Sciences D.M. Golitsinskiy, Engineers Ye.S. Baranos and I.A. Andreyev]

[Abstract] The "tunnels and subways" Department of the Leningrad Railroad Transport Engineering Institute has undertaken a complex scientific study to solve problems related to the broad introduction to practice of underground construction of lightweight supports. Studies were performed both in the laboratory on models using the method of equivalent materials and by theoretical calculations. The comparative load-bearing capacity of monolithic concrete lining 50 cm thick in rock with many clay interlayers and linings of gunite 10 cm thick in combination with anchors and cementation of the adjacent rock to a depth of 1.5 m was estimated. The adjacent cemented rock area was found to influence the static operation of gunite linings significantly. The use of anchors also significantly influenced strength. Results showed that the two types of linings have comparable strength. The use of additional anchors was found to be capable of replacing cementation of the surrounding rock, even with decreased gunite layer thickness. The combination of gunite with anchors and cementation is considered to be the most promising for production of lightweight tunnel linings. Figures 3.

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OPTIMAL PLACEMENT, PRODUCTION STABILITY OF UNDERGROUND SITES

Moscow ENERGETICHESKOYE STROITELSTVO in Russian No 12, Dec 85 pp 35-36

[Article by Engineer I. R. Shvachko and Candidate of Technical Sciences S. A. Yufin]

[Abstract] Theoretical determination of stability factors for underground structures and planning of supports are based on a 3-stage numerical modelling scheme using the method of finite elements. In the first two stages, the static and deterministic representation of cracks and fractures in a finite-element model allows determination of the zone of possible mobility and failure along planes of known and probable faults in the continuity of the mass. In the third stage, based on the principles of fracture mechanics, the strength of continuous blocks of rock between cracks is studied. A program system called STATAS, supplemented with specialized subroutines, is used to perform the calculations. This program system is briefly described. The calculations are used to determine the optimal orientation of underground structures and assure their stability, allowing a decrease in the expenditure of expensive materials for the support of workings and selection of the most suitable technology for driving underground openings. The STATAS programs require minimal machine time and are particularly effective in planning underground openings for nuclear power plants. Figures 2, references 3: Russian.

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CONSTRUCTION METHODS AND MATERIALS

BRIEFS

CEMENT PLANT SURPASSES PLAN--Teploozersk Settlement, Jewish Autonomous Oblast--The Teploozersk Badge of Honor Cement Plant manufactured during the first month of this year 2,000 tons of high-quality cement above the plan, exactly as much as the collective had committed itself to produce by the day of the 27th CPSU Congress opening. The labor success has a strong foundation: the Teploozerskers won first place and the Challenge Red Banner in the All-Union Socialist Competition of the branch's enterprises for 1985. By 25 February the cementmakers will have increased output of product above the plan 1½-fold. [L. Sharomov] [Text] [Moscow STROITELNAYA GAZETA in Russian 19 Feb 86 p 2] 11409

ML-1 CEMENT PLASTICIZER USE--Ignalina, Lithuanian SSR--The first cubic meter of concrete with the ML-1 superplasticizer additive was laid 4 years ago in monolithic structure of the Ignalinskaya AES. Since then more than a million cubic meters of the "flowing" mixes were used in building the electric-power station's main and auxiliary facilities. Thanks to the use of the plasticizer, 42,000 tons of cement were saved, and the economic benefit from introducing the innovation was about a million rubles. Labor productivity of the concreting was raised 2-fold to 2.5-fold. [A. Poletayeva] [Text] [Moscow STROITELNAYA GAZETA in Russian 19 Feb 86 p 3] 11409

LATVIAN BUILDING-MATERIALS PLANT--Daugavpils--Workers of the Daugavpils Plant for Building Materials and Structure made a revision in the plan for work on the communist Subbotnik [unpaid workday on day off]. The enterprise obtained its first output produced on the new industrial line. The plant produced on the labor holiday about 500 cubic meters of prefabricated panels--one-fourth more than previously contemplated. The cassette-conveyor method introduced at the enterprise enables time for manufacturing structure intended for erecting housing with improved layouts to be cut appreciably. With the help of scientists, the enterprise's innovators unified also the assembly of reinforcement units and the manufacture of embedded inserts. Almost 40 percent less steel is now being expended on manufacturing them. On the Subbotnik the enterprise's collective decided to operate completely on resources that had been saved. [TASS] [Text] [Moscow STROITELNAYA GAZETA in Russian 14 Feb 86 p 1] 11409

NEW CONSTRUCTION PANELS--Krasnogorsk--The collective of a combine for thermo-sound insulating products has mastered a technological line for the production of perforated gypsum sound-absorbing panels. The plans call for the production of these panels to be raised to 50 percent of the overall volume of products being produced. During 1986 alone, 375,000 square meters of this product will be shipped to construction sites in the capital and oblast. Compared to panels produced earlier, the new ones are distinguished by an improved aesthetic appearance. Of some importance is the fact that the amount of materials required for the production of these panels has been decreased considerably. Perforated panels will be used for finishing off suspended ceilings and this will lower considerably the noise level in rooms. [Text] [Moscow LENINSKOYE ZNAMYA in Russian 16 Feb 86 p 2] 7026

ALMA-ATA FACTORY BEGUN--Construction has begun on a dry construction compounds factory in Alma-Ata with a 100,000 ton annual capacity. Preparation of compounds under factory conditions will largely guarantee their quality. Powerful aggregates and electronic equipment will be set up at the new enterprise, developed by designers and technicians from various republic departments. Specialists from the Alma-Ata Soyuzgiprosovkhovodstroy Institute designed the factory. "During the 12th Five-Year Plan the amount of capital investments in construction will increase significantly," states Yu. Ponomarev, deputy chairman, KaSSR Gosstroy. "More and more attention is being paid to industrialization of the branch, improving technologies and using new designs and materials. The new factory in Alma-Ata is an example of the qualitative modernization of the republic's construction industry during the current five-year plan, called for by the comprehensive program for raising the technical level of construction. [by IZVESTIYA correspondent E. Matskevich] [Excerpts] [Moscow IZVESTIYA in Russian 20 Mar 86 p 1] 9069

SUPERPLASTICIZER PRODUCED--Yelgava--The first batch of a valuable product, superplasticizer, was produced by the large new shop of the Yelgava Construction Materials and Structures Factory. The use of each kilogram of the new product at enterprises and on construction sites will save 10-15 kilograms of cement. [by V. Rubtsov] [Text] [Moscow TRUD in Russian 25 Mar 86 p 1] 9069

SILICATE FACTORY MODERNIZED--Kaunas--The 60 year old Bitukas Silicate Factory of the Lithuanian Ministry of the Construction Materials Industry is growing younger before one's eyes. The first phase of its reconstruction, which enterprise specialists are carrying out without stopping product output, has been completed. A new technological line has been assembled at the gas silicate goods shop according to that of the Tallin Silicate Concrete Scientific Research, Planning and Design Institute, to manufacture 90,000 cubic meters of small building blocks annually. The productivity of this comprehensively mechanized line is three times higher than it was using the old technology. The production of thermal insulating materials is also being modernized. Production of standardized sheets for roofing has begun at the flow line designed at the Vilnius All-Union Scientific Research Institute for Thermal Insulation. Another technological line is planned for the manufacture of Silikpor sound absorbing sheets for suspended ceilings. [by V. Tumanov] [Text] [Moscow STROITELNAYA GAZETA in Russian 11 Apr 86 p 2] 9069

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CEMENTLESS CONCRETE PRODUCTS--Yangiyer, Syrdarya Oblast [Uzbekistan] (TASS)--
The first batch of unusual concrete goods has been produced at the Yangiyer Construction Materials and Structures Combine of Glavsredazirsovkhozstroy. The main component, cement, is absent. Instead, chemical industry alkaline-slag binding waste products are used. Trellises for vineyards; equipment for conveyor irrigation systems; foundation blocks; and slabs for roads and lining irrigation canals can be manufactured from such concrete without degrading the high quality of the product. Annually the combine will manufacture 30,000 cubic meters of precast reinforced concrete products. New types of resource conserving technologies are being extensively introduced at construction industry enterprises of the republic's water handling facilities. [Text] [Moscow STROITELNAYA GAZETA in Russian 23 Apr 86 p 2] 9069

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